

## Instruction Manual Speed Controller for Small Geared Motors MGSD Series



- Thank you for purchasing the Panasonic speed controller MGSD for small geared motor.
- Carefully read this manual thoroughly before installing and operating the product.

**Section "Safety Precautions" (pp. 3-9) contains very important information concerning safety and reliable operation.**

Keep this manual in a safe location where it can be easily accessed for reference.

**The user and operator should always refer to this manual.**

- This product is for industrial equipment. Don't use this product at general household.

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Various icons and important messages are used in this manual to avoid problems that could result in hazards to personnel and damage to properties.

- The below explains what will happen if someone fails to heed a particular precaution statement.



## Danger

Danger statements are used to indicate hazards or unsafe practices which COULD result in severe personal injury or death.



## Caution

Caution statements are used to indicate hazards or unsafe practices which COULD result in minor personal injury or product or property damage.

- The following symbols are used to describe the type of Do and Don't.



This symbol is used to indicate a practice that shall not be attempted.



This symbol is used to indicate a practice that shall be done.

# Safety Precautions

Please observe safety precautions fully.




## Danger

	Don't use the speed controller in or near environment containing water, corrosive gas, flammable gas or flammable material.	To prevent possibility of fire.
	Don't place flammable materials near the motor (including the controller).	
	Don't make soldering joint on a round pin of the speed controller.	
	Don't damage leadwires or subject leadwires to excessive stress such as strong pressure, heavy object and clamping load.	Will cause electric shock, malfunction or damage.
	Don't use leadwires soaked in water or oil.	
	Don't use the controller in a place subject to excessive vibration or shock.	Will cause electric shock, personal injury or fire.
	Don't remove the speed controller setting knob.	Will cause burn injury or electric shock.
	Don't touch rotating member of the motor.	Will cause personal injury.
	Don't touch potentially hot motor casing.	Will cause burn injury.
	Don't attempt to carry out wiring or manual operation with wet hand.	Will cause electric shock, personal injury or fire.
	Wiring work should be done by a qualified electrician.	Wiring work done by an inexperienced person will cause electric shock.

	Use overcurrent protection device, ground-fault circuit interrupter, overtemperature protecting device, and emergency stop device.	Failure to heed these requirements will result in electric shock, personal injury or fire.
	After an earthquake, first verify safety.	
	Before transferring, wiring or checking product, disconnect the power source for safe isolation.	Incomplete power disconnection will cause electric shock.
	Securely install the equipment to prevent bodily injury or fire in case of earthquake.	Failure to heed these requirements will result in electric shock, personal injury, fire, malfunction or damage.
	Provide emergency stop circuit externally for instantaneous interruption of operation and power supply.	
	Install the unit to a nonflammable construction (e.g. metal).	Installation on a flammable material may cause fire.
	Installation area should be free from excessive dust, and from splashing water and oil.	Failure to heed this precaution will result in electric shock, personal injury, fire, malfunction or damage.
	Correctly run wirings to the tachogenerator.	Incorrect wiring will result in short circuit, electric shock, personal injury, etc.
	Turn off power upon power interruption or activation of overtemperature protecting device.	Unpredictable restarting will cause personal injury.


# Safety Precautions


Please observe safety precautions fully.

	<b>Install the equipment in the control board and keep the terminal block and protect it from inadvertent contact.</b>	Failure to heed this precaution will result in electric shock, personal injury, fire, malfunction or damage.
	<b>After correctly connecting leadwires, insulate the live parts with insulator.</b>	Incorrect wiring will result in short circuit, electric shock, fire or malfunction.
	<b>Ground the motor ground to the earth.</b>	Floating ground circuit will cause electric shock.




## Caution


	<b>Don't move the product by holding leadwires or motor shaft.</b>	Failure to heed these precautions will cause bodily injury.
	<b>Don't put the machine into unstable operation.</b>	
	<b>Once power failure occurs, don't come close to the machine that will unexpectedly start upon recovery of the power. Provide secure mechanism so that the restarting of the machine will not cause personal injury.</b>	
	<b>Don't apply excessive shock to the motor shaft.</b>	Excessive shock will cause failure.
	<b>Don't apply excessive shock to the product.</b>	
	<b>Don't get on the product. Don't place heavy object on the product.</b>	Failure to heed this instruction will result in electric shock, personal injury, fire, malfunction or damage.

	<b>Don't lock the motor shaft while the motor is running.</b>	Locked motor will cause fire, electric shock, or malfunction.
	<b>Don't clog or put an object into the radiating hole of the motor.</b>	Failure to heed this instruction will result in fire.
	<b>Don't turn off and on power so frequently.</b>	Failure to heed this instruction will result in fire, personal injury, malfunction or damage.
	<b>Don't pull leadwires with an excessive force.</b>	Failure to heed this instruction will cause fire, electric shock or personal injury.
	<b>Don't use the equipment in highly intensive electric field.</b>	Failure to heed these instructions will cause personal injury or fire.
	<b>Don't use the equipment under direct sunshine.</b>	
	<b>Don't use the equipment in an environment where electrostatic voltage potentials may be produced.</b>	Induced malfunction will cause malfunction or personal injury.
	<b>Don't drop or cause topple over of something during transportation or installation.</b>	Failure to heed this instruction will result in personal injury or malfunction.
	<b>Don't use a variable transformer or transformer having capacity insufficient to feed the load.</b>	Failure to heed this instruction will cause fire, electric shock or malfunction.
	<b>Don't use the equipment outside the limits described on the nameplate and user's manual.</b>	Failure to heed this instruction will result in electric shock, personal injury, fire, malfunction or damage.
	<b>Never attempt to perform modification, dismantle or repair.</b>	Failure to heed this instruction will cause fire, electric shock or personal injury.

# Safety Precautions

Please observe safety precautions fully.

	<b>Perform installation by taking into consideration the mass of the body and rated output of the product.</b>	Failure to heed these instructions will result in personal injury or malfunction.
	<b>Adjust ambient environmental condition of motor and speed controller to match the motor operating temperature and humidity.</b>	
	<b>Exactly follow the installing method and direction specified.</b>	
	<b>Use the speed controller in combination with the specified motor.</b>	Failure to heed this instruction will result in fire.
	<b>Connect the motor electromagnetic brake control relay in series with a ground-fault interrupter, circuit breaker and relay so that they turn off the circuit upon emergency stop.</b>	Lack of connection will cause malfunction.
	<b>Test-run the securely fixed motor without loading to verify normal operation, and then connect it to the mechanical system.</b>	Operation using a wrong model or wrong wiring connection will result in personal injury.
	<b>Level of input voltage to the speed controller should correspond to the motor rated voltage.</b>	Operation from a voltage outside the rated voltage will cause electric shock, personal injury or fire.
	<b>Provide protection device against idling of electro-magnetic brake or gear head, or grease leakage from gear head.</b>	Lack of protection will cause personal injury, damage, pollution or fire.

	<b>Don't place any obstacle object around the motor and peripheral, which blocks air passage.</b>	Temperature rise will cause burn injury or fire.
	<b>Correctly run and arrange wiring. Maintenance must be performed by an experienced personnel.</b>	Wrong wiring will cause personal injury or electric shock.
	<b>Always keep power disconnected when the power is not necessary for a long time.</b>	Improper operation will cause personal injury.
	<b>Scraps must be treated as industrial waste.</b>	

# 1. Introduction

## Unpacking

- Verify that the model No. matches your order sheet.
- Damage in transit is not found.

**Should you find any discrepancy in the product, consult your local dealer.**

## General description of the speed controller

The MGSD type speed controller is designed to operate with a small geared motor to adjust and vary its speed. The speed is adjusted from the speed setting knob. The input voltage can be single-phase 100-120 VAC, or single-phase 200 – 240 VAC. The speed controller is compatible with EC directive and UL standard.

Compatible with DIN terminal block which is convenient to install on the distribution board, and small timer common option available from Panasonic Electric Works Co.,Ltd. (pp. 32 – 37).

Read this manual thoroughly so that you will become gradually acquainted with the excellent features of your speed controller for small geared motor and understand how to fully utilize these functions. The speed controller is designed to be integrated into a general control board. The product must be handled by experienced personnel familiar with the product.

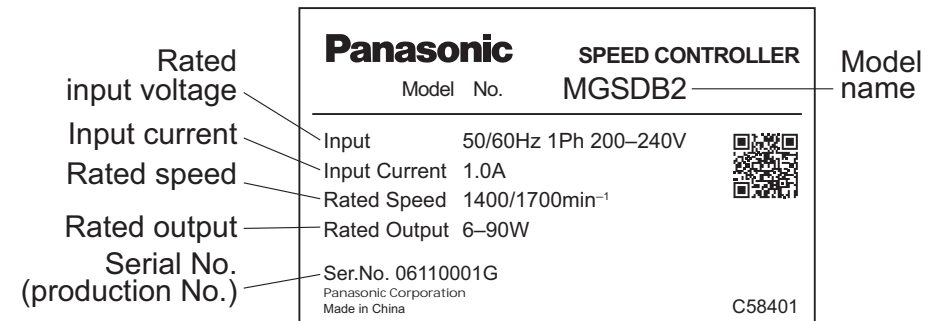
## Designation and rating on the nameplate

Rated input voltage  
Input current  
Rated speed  
Rated output  
Serial No. (production No.)

**Panasonic** SPEED CONTROLLER  
Model No. MGSDB2

Input 50/60Hz 1Ph 200–240V  
Input Current 1.0A  
Rated Speed 1400/1700min<sup>-1</sup>  
Rated Output 6–90W  
Ser.No. 06110001G  
Panasonic Corporation  
Made in China

Model name  
C58401



## Description of model No.

**M G S D B 2**

1–4 | 5 | 6

Series | Input power supply

Output

100V	A : 3 – 40W B : 60 – 90W
200V	B : 6 – 90W

1. Single phase 100 – 120 VAC  
2. Single phase 200 – 240 VAC

## Serial number (production No.)

The Ser. No. on the nameplate contains the following codes.

Example

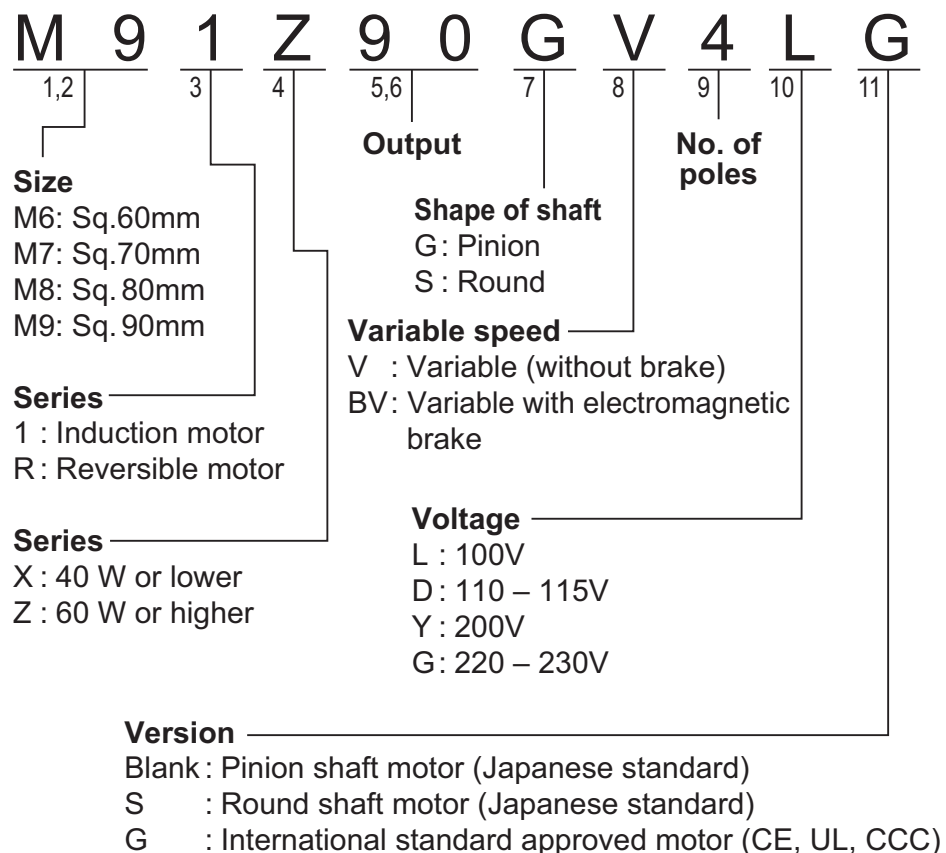
Ser.No. \* **06** **11** **0001** \*

Manufacturing year | Manufacturing month | Sequential number

This product was manufactured in November 2006 and assigned a sequential number 0001.

# 1. Introduction

## Motor Part Number

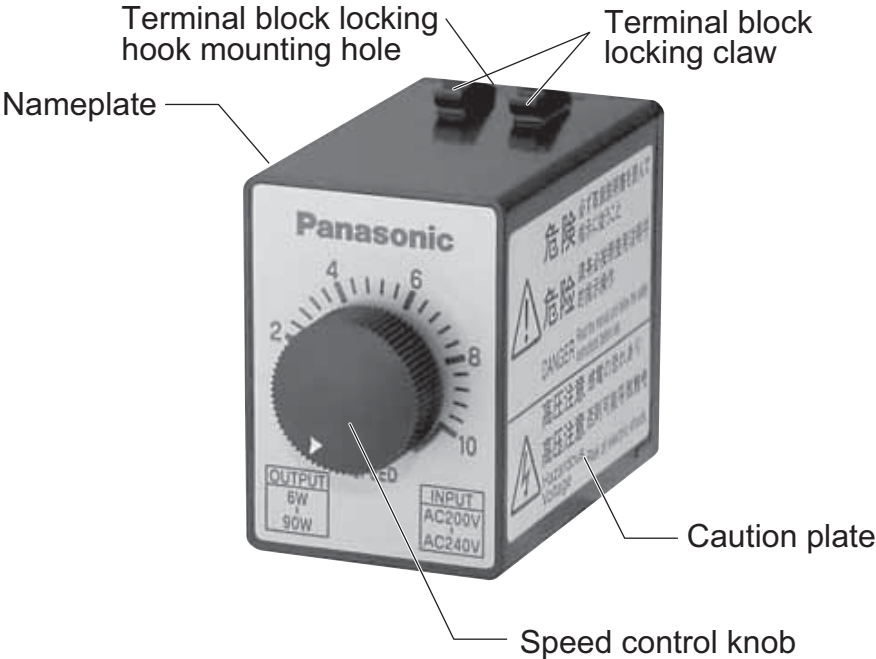


## Rating

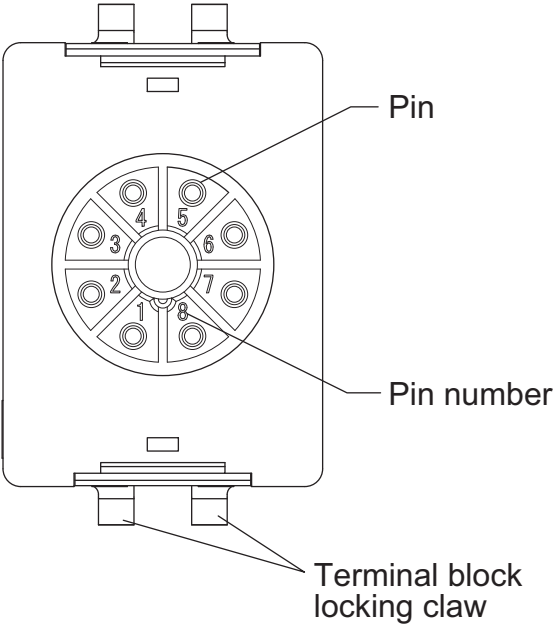
Model No.	Output	Power supply	Compatible induction motor	Compatible reversible motor
				Compatible reversible motor with electromagnetic brake
MGSDA1	3—40W	AC100V to AC120V	M61X***V4**	M6RX***V4** M6RX**GBV4**
			M71X***V4**	M7RX***V4** M7RX**GBV4**
			M81X***V4**	M8RX***V4** M8RX**GBV4**
			M91X***V4**	M9RX***V4** M9RX**GBV4**
			M91Z***V4**	M9RZ***V4**
MGSDB1	60—90W			
MGSDA2	6—90W	AC200V to AC240V	M61X***V4**	M6RX***V4** M6RX**GBV4**
			M71X***V4**	M7RX***V4** M7RX**GBV4**
			M81X***V4**	M8RX***V4** M8RX**GBV4**
			M91X***V4**	M9RX***V4** M9RX**GBV4**
			M91Z***V4**	M9RZ***V4**



## 2. Names and functions



<Rear panel>



## 3. Installation

### Installation location

- (1) Indoors free from rain and direct sunlight: the product is not of a waterproof construction.
- (2) Free from vibration  $4.9 \text{ m/s}^2$  or more; shock, dust, iron powder or oil mist; splash of water, oil and grinding fluid; and away from flammable materials, corrosive gas ( $\text{H}_2\text{S}$ ,  $\text{SO}_2$ ,  $\text{NO}_2$ ,  $\text{Cl}_2$ , etc.) or flammable gas.
- (3) Well ventilated dry and clean location containing negligible amount of oil or dust.

### Environmental condition

Item	Condition
Operating temperature	$-10 - 50^\circ\text{C}$
Storage temperature	$-20^\circ\text{C} - 60^\circ\text{C}$
Operating humidity	90% RH or below (no dewing)
Allowable vibration	$4.9 \text{ m/s}^2$ or below (10 – 60 Hz)
Altitude	1000 m max.



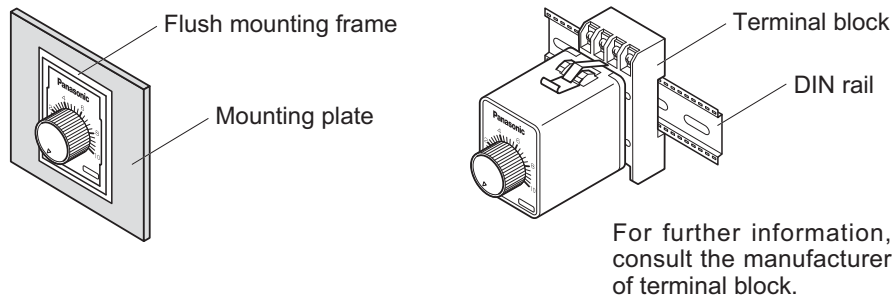
## 3. Installation

### Installing method

The product can be mounted in either of the following two ways but must be installed inside the control board.

Orientation of the product in the control board is not limited.

- Using flush mounting frame (sold separately: see p. 34)
- Using miniature DIN terminal block (sold separately: see pp. 32 and 33)



### Caution

Special care is always given to our products during manufacturing and delivery to keep quality from deteriorating. Customer is also required to keep the quality by designing and providing failsafe and safety operating field and condition so that external noise, electrostatic charge, wrong wiring, wrong parts are prevented or eliminated.

In rare instances, the product may give off fume like a smoke of a cigarette if it is in a specific malfunctioning state. Precaution against possible fumes should be taken into consideration when the product is used in a clean room, etc.



**DON'T**

**Don't turn the shaft of speed control potentiometer using a tool with the knob removed.**

High voltage is applied to the potentiometer:  
Danger!

## 4. Wiring diagram

### Considerations for wiring

- Use a terminal block or socket for connection. Do not solder the lead to the pin.
- When using a transformer or variable transformer, its capacity must be larger than the rated current of the product by the factor of 2 or more, to assure reliable operation.
- If the input lead is longer than 1 m (e.g. lead from a tachometer generator), seal it or replace it with shielded cable to prevent induction of noises.

### <Precautions>

- Don't ground the shielding.
- The length of the wiring between the speed controller and the motor should be 3 m or shorter.
- Wiring from the tachometer generator (TG) carries current at a high voltage: Risk of electrical shock.
- When using a cooling fan motor or a motor with thermal protector, also see p. 26.

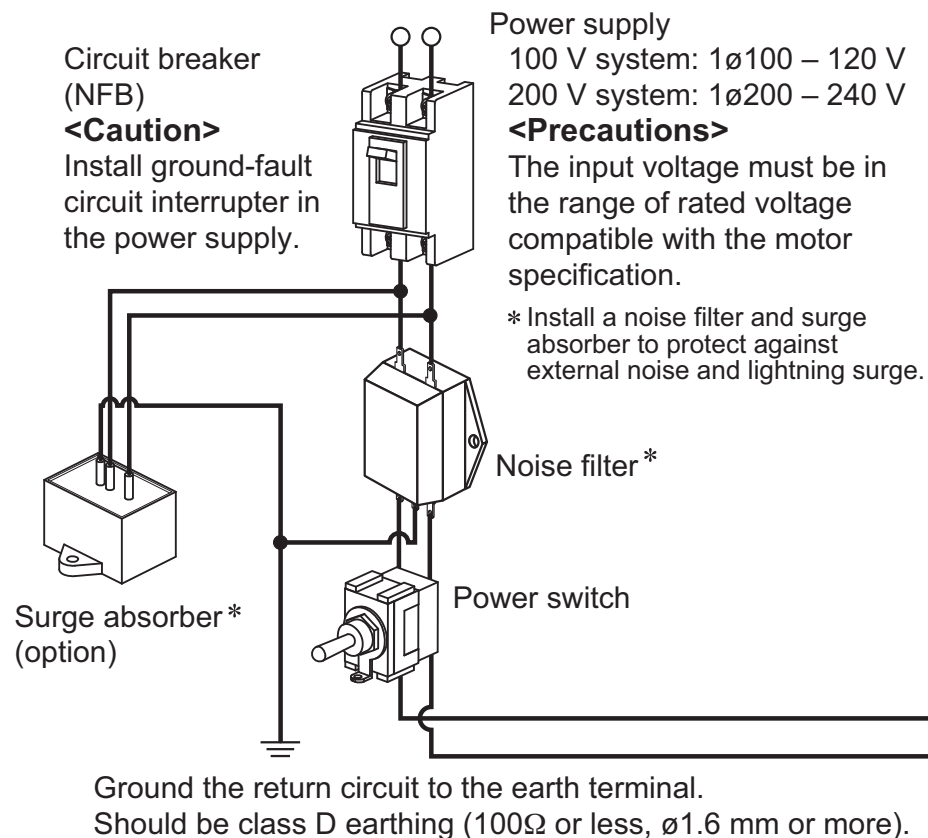
## 4. Wiring diagram

### Wiring diagram

- The motor speed can be adjusted from the speed setting knob on the controller front panel.
- **The thick continuous lines** represent main circuit. Use conductor of size 0.75 mm<sup>2</sup> (AWG 18) or larger for the main line.
- **The thin continuous lines** represent signal circuit. Use conductor of size 0.3 mm<sup>2</sup> (AWG 22) or larger in the signal circuit. When the distance from the tachometer generator (TG) is long, use shielded twisted pair cable.

#### <Caution>

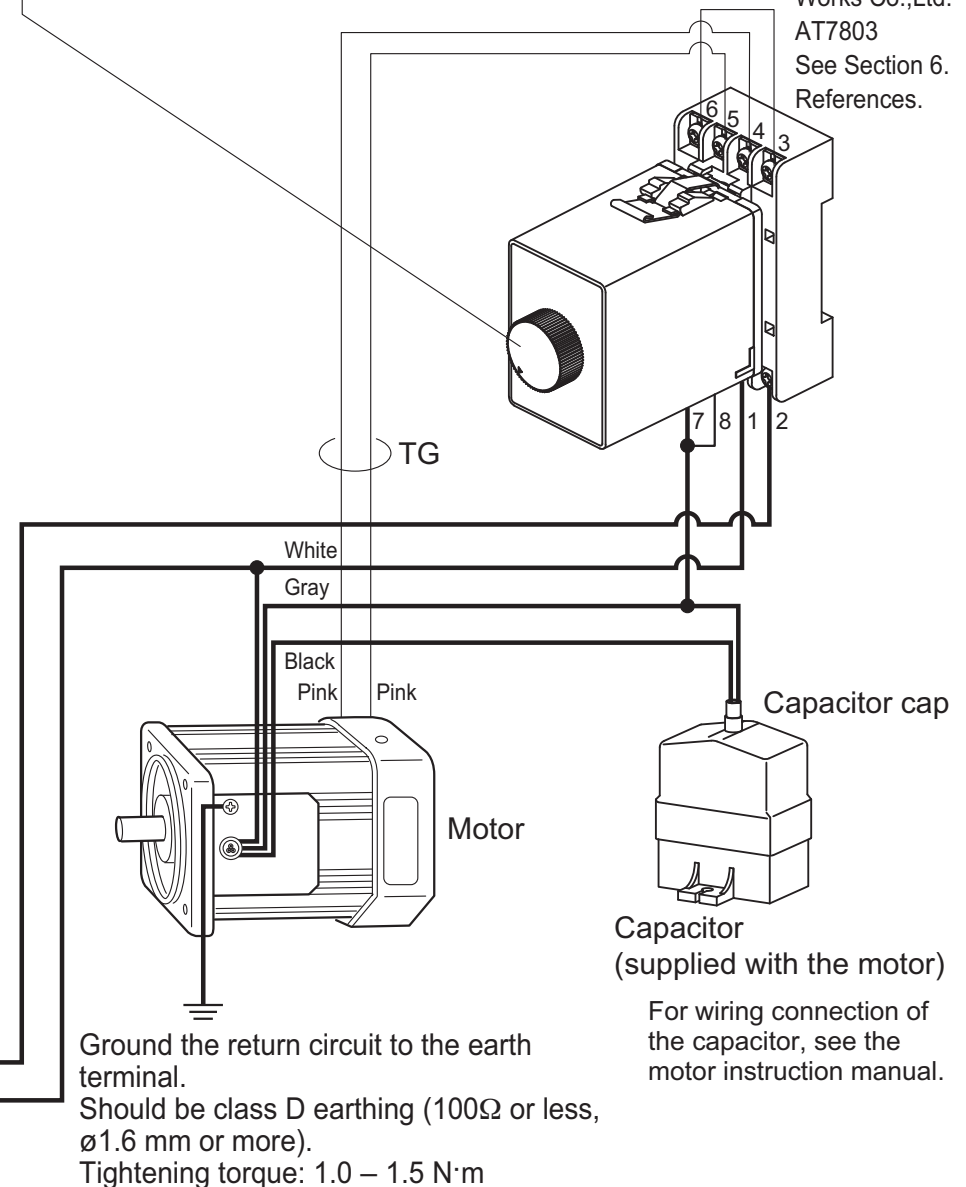
Do not ground the shielding material.



### Speed control knob

This knob adjusts the rotating speed of the motor from 90 (min<sup>-1</sup>) to 1400/1700(min<sup>-1</sup>) at 50/60 Hz.

Miniature DIN terminal block  
 Panasonic Electric Works Co.,Ltd.  
 AT7803  
 See Section 6. References.

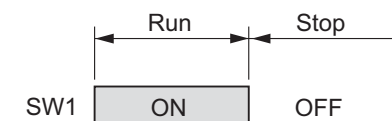
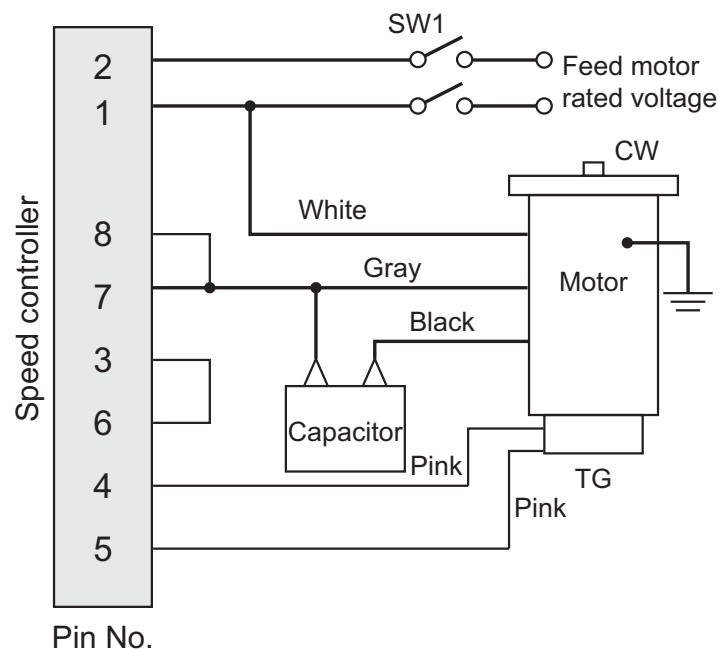


## 4. Wiring diagram

### Standard electrical wiring diagram

#### Speed change only

#### Unidirectional rotation



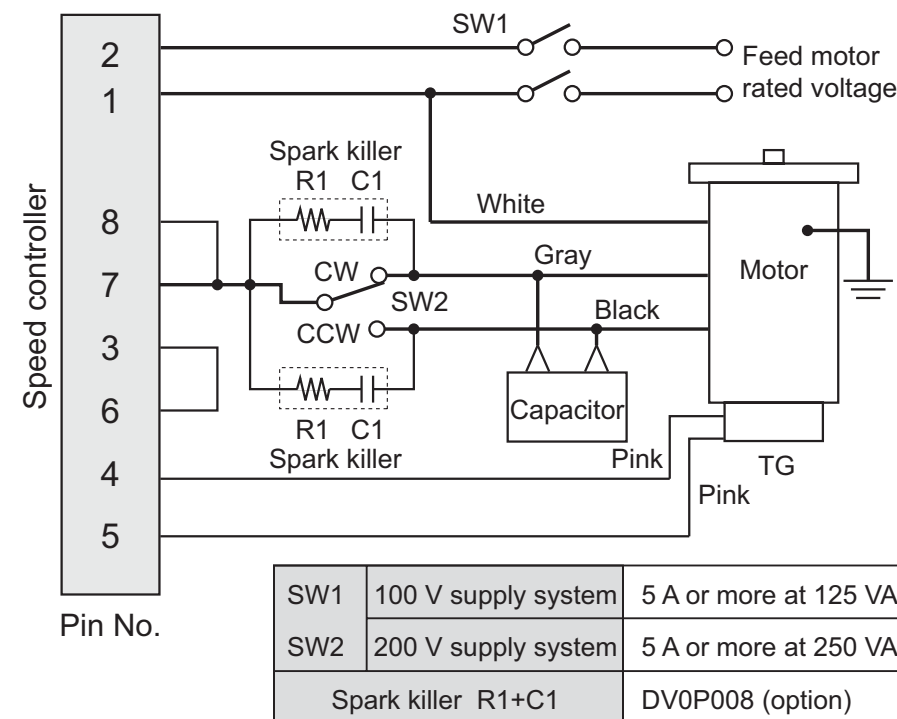
#### <Note>

This wiring diagram causes the motor to rotate clockwise when viewed from the motor shaft end.

To run the motor counterclockwise, interchange the connecting point of black and gray leads.

Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise

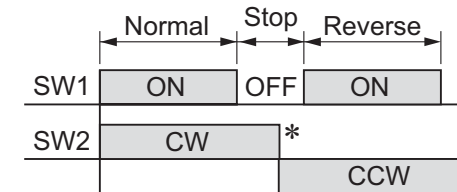
### Normal/reverse rotation



For optional accessories, see p. 30.

#### <Precautions>

When using independent relay contacts for SW2 to change over normal/reverse, interlock both contacts so that they will not close simultaneously.



SW1: Power switch  
SW2: Normal/Reverse selector switch

#### \* • To change rotation direction of induction motor

Provide a motor halt period. Switch over SW2 after complete stop of the motor.

#### • To change rotation direction of reversible motor

A motor halt period is not necessary. Switch over SW2 while keeping SW1 turned ON. When configuring SW2 with relay contacts, use a relay having large gap between contacts (e.g. HG/HP relay from Panasonic Electric Works Co.,Ltd.) to prevent malfunction due to short-circuited capacitor.

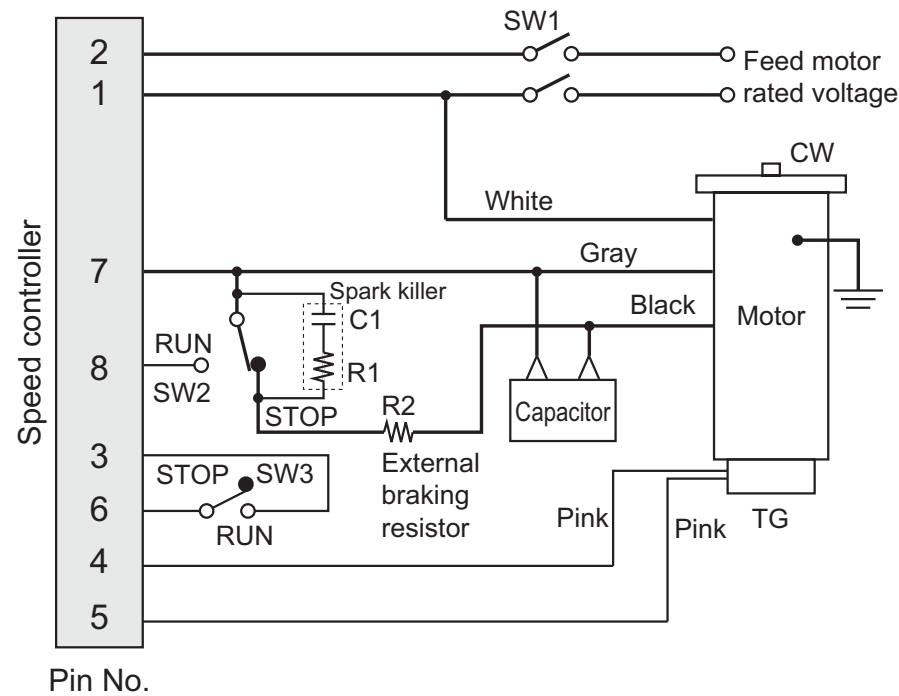
# 4. Wiring diagram

## Unidirectional rotation and electric brake

### <Precautions>

- The number of start/stop operations should be 6/min. or less.

### 25 W or less



### <Note>

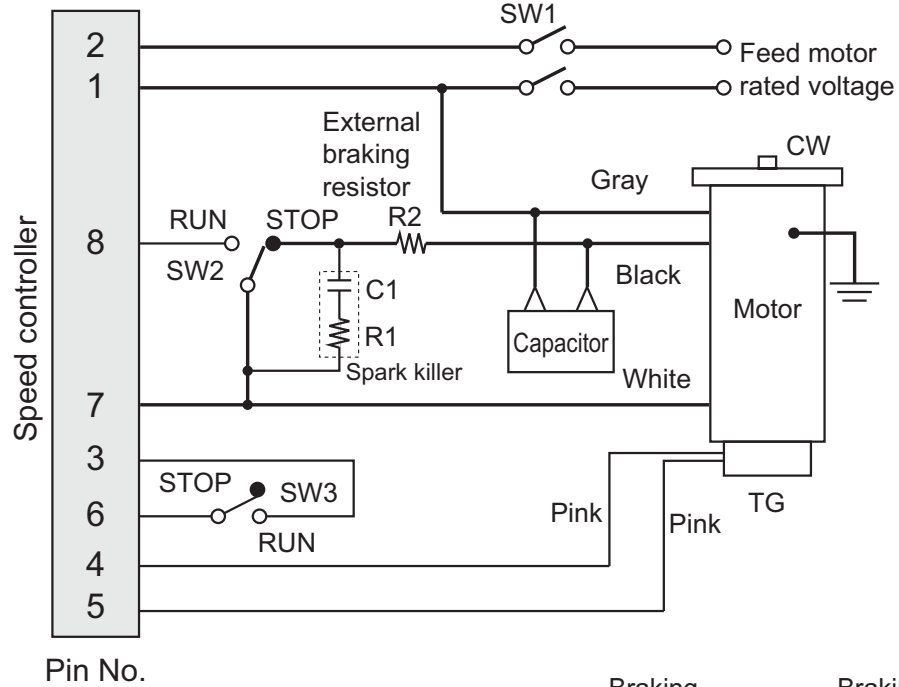
This wiring diagram causes the motor to rotate clockwise when viewed from the motor shaft end.

To run the motor counterclockwise, interchange the connecting point of black and gray leads.

SW1	100 V supply system	5 A or more at 125 VAC
SW2	200 V supply system	5 A or more at 250 VAC
SW3	10 mA at 10 VDC	
Spark killer R1+C1		DV0P008 (option)
External braking resistor R2		DV0P003 (option)

For option, refer to p. 29, 30 onward.

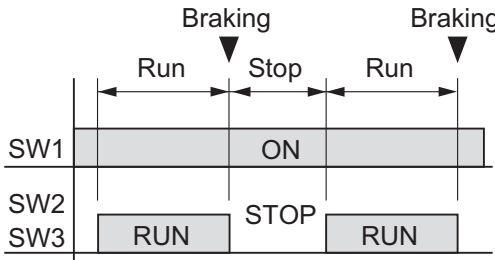
### 40 W or higher



### <Precautions>

When SW2 and SW3 are switched from RUN to STOP, electric braking is applied for approx. 0.5 sec., and the motor stops instantly.

Difference in switching time between SW2 and SW3 must be 0.1 sec. or smaller.



SW1: Power switch  
SW2: RUN/STOP switch  
SW3: Braking start switch

### <Precautions>

If SW2 is in RUN position while SW3 is in STOP, abnormal operation occurs (full speed rotation for a short time; or if SW3 is in RUN position while SW2 is in STOP, motor temperature rises excessively).

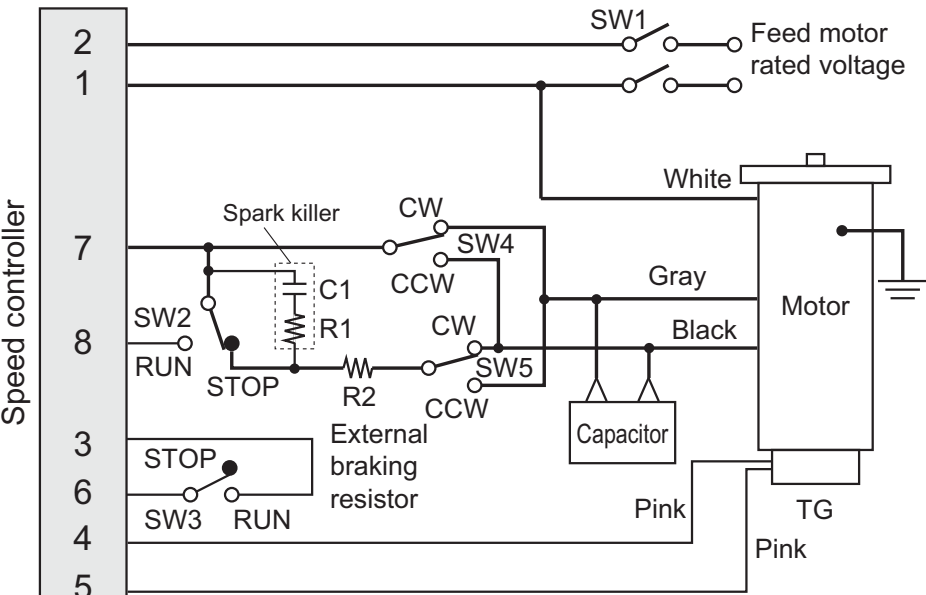
# 4. Wiring diagram

## Normal/reverse rotation and electric brake

### <Precautions>

- The number of start/stop operations should be 6/min. or less.

### 25 W or less



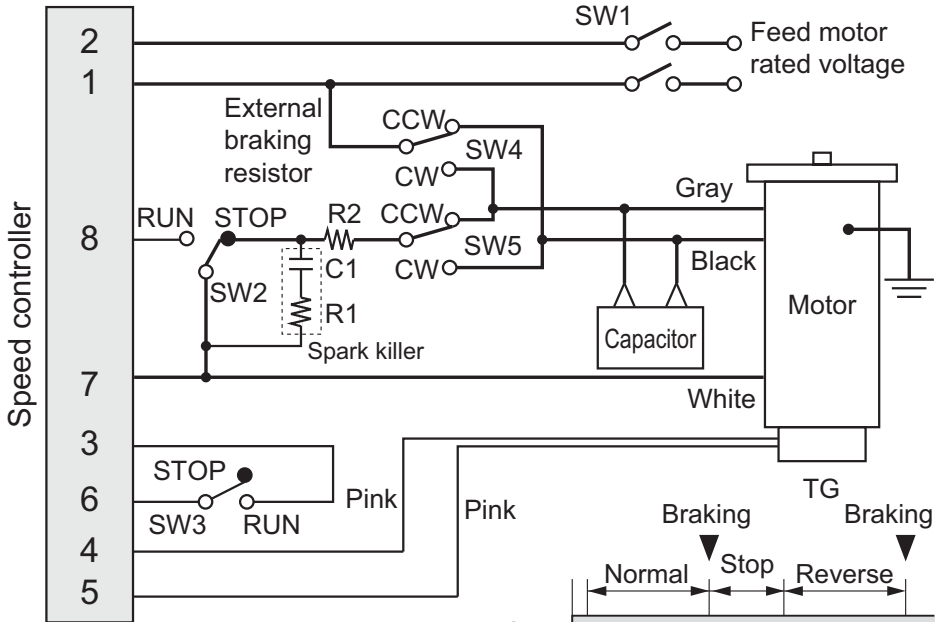
Pin No.

Rotating direction viewed from shaft end	
CW	Clockwise
CCW	Counterclockwise

SW1, SW2	100 V supply system	5 A or more at 125 VAC
SW4, SW5	200 V supply system	5 A or more at 250 VAC
SW3		DC10V 10mA
Spark killer R1+C1		DV0P008 (option)
External braking resistor R2		DV0P003 (option)

For option, refer to p. 29, 30 onward.

### 40 W or higher



Pin No.

### <Precautions>

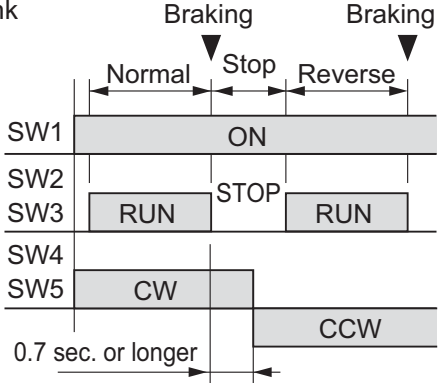
When SW2 and SW3 are switched from RUN to STOP, electric braking is applied for approx. 0.5 sec., and the motor stops instantly. Difference in switching time between SW2 and SW3 must be 0.1 sec. or smaller.

### <Precautions>

If SW2 is in RUN position while SW3 is in STOP, abnormal operation occurs (full speed rotation for a short time; or if SW3 is in RUN position while SW2 is in STOP, motor temperature rises excessively).

### <Precautions>

Never attempt to change direction (SW4, SW5) while motor is running or electric brake is being applied.



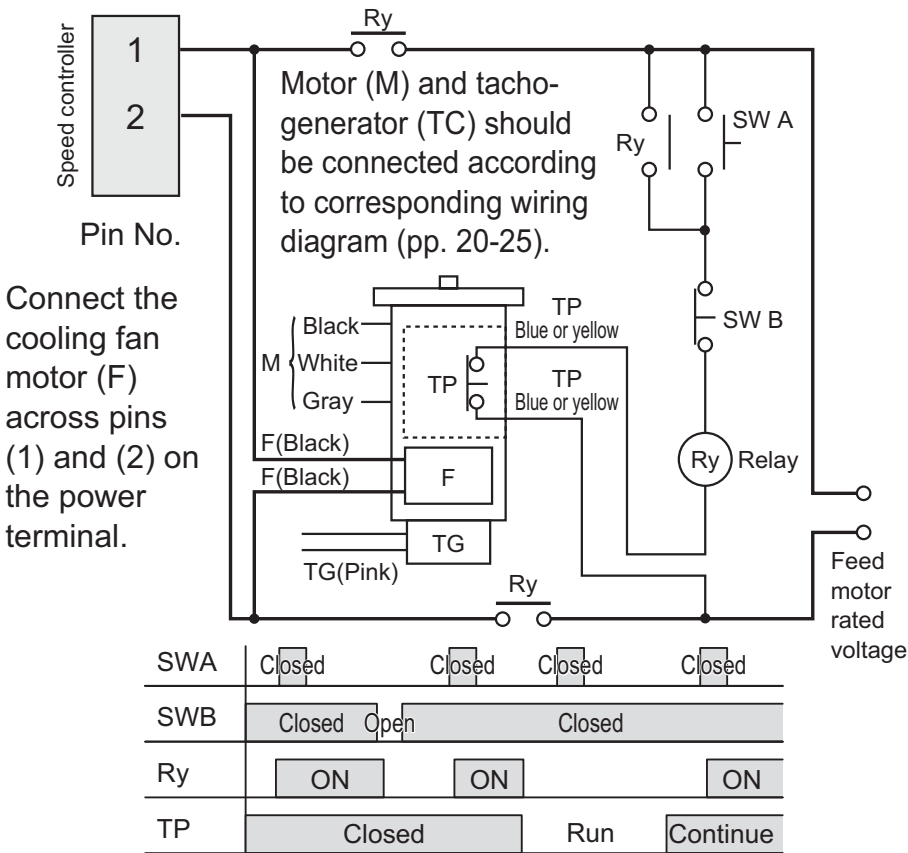
SW1: Power switch  
SW2: RUN/STOP switch  
SW3: Braking start switch  
SW4, SW5: Normal/Reverse selector switch

# 4. Wiring diagram

## Peripheral wiring

### Motor wiring with cooling fan motor (F) or thermal protector (TP)

The thermal protector (TP) is an automatic reset type. To prevent hazards caused by restarting of TP, operate it by connecting wiring as shown below. Don't connect TP directly to the power supply.

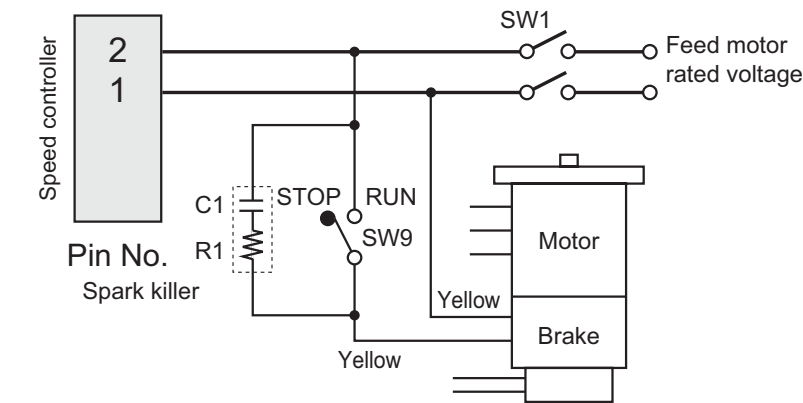


Once the TP operates, cooling period is required until the operation can start.

SW A		Momentary N.O. contact
SW B		Momentary N.C. contact
Relay Ry	100 V supply system	AC125V 5 A or more 3a contact
	200 V supply system	AC125V 5 A or more 3a contact

### Wiring to electromagnetic brake (40 W or below)

Variable speed motor with electromagnetic brake should be wired as shown below.



SW1	100V supply system	AC125V 5 A or more
SW9	200V supply system	AC250V 5 A or more
Spark killer R1+C1		DV0P008 (option)

For option, refer to p. 30 onward.

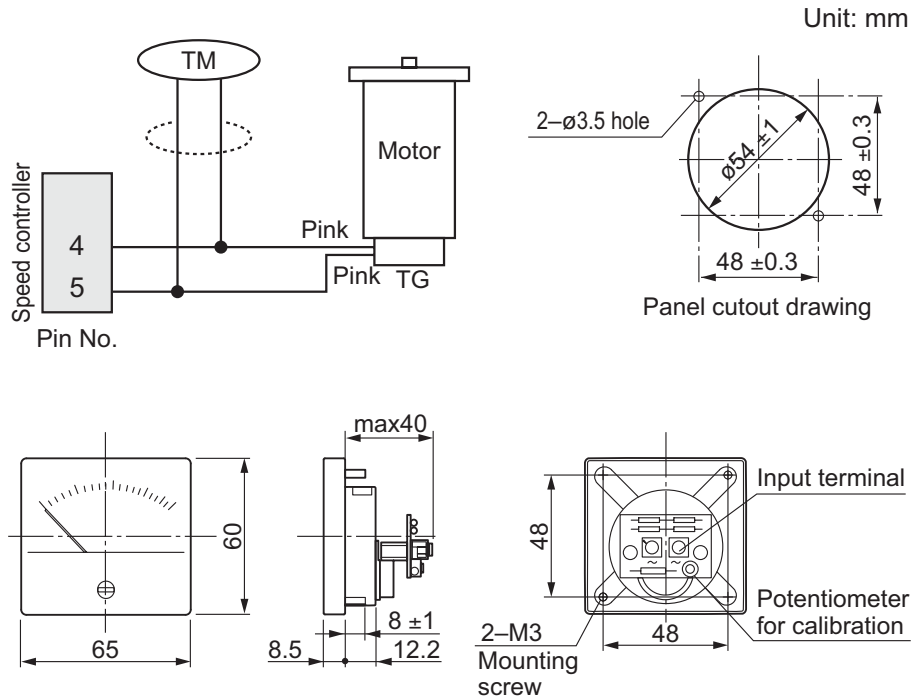
### <Precautions>

1. Operate SW9 simultaneously with RUN/STOP switching of other switches, if any.
2. For remaining wirings, refer to corresponding wiring diagram.

## 5. Options

### Tachometer (DVOP001)

This tachometer is especially designed to operate with our speed controller so that it can provide easier displaying of motor speed.



#### <Precautions>

- Connect the tachometer in parallel with the tachometer generator (TG).
- If the tachometer (TM) requires longer connection cable, use shielded twisted pair cable. Don't ground shielding of the cable.
- Accuracy of tachometer readings will depend on variation in motor performance and operating environment (temperature and noise). The tachometer should be used as a rough indicator.

#### <Note>

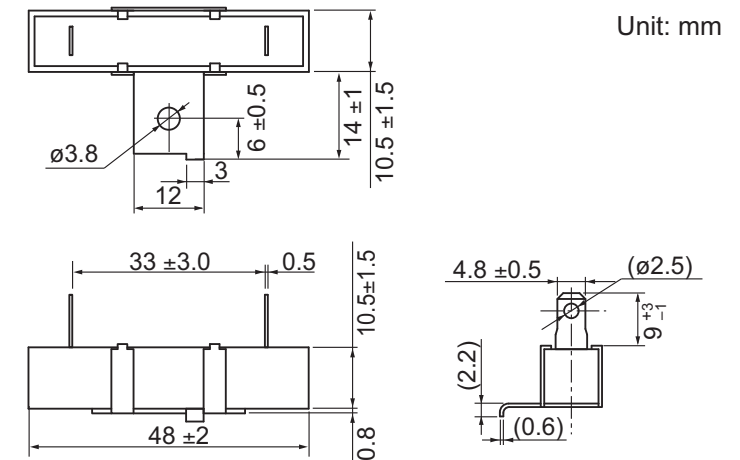
Calibrate the scale of the tachometer (TM) from the potentiometer on the rear panel.

1. While running the motor at its full rotation speed without load, adjust to  $1450 \text{ min}^{-1}$  if power supply is at 50 Hz, or  $1750 \text{ min}^{-1}$  if 60 Hz.
2. Monitor the output signal of the TG on an oscilloscope and determine the frequency. And adjust:  
rotating speed  $N (\text{min}^{-1}) = 5 \times f (\text{Hz})$

Caution: Since the circuit is not isolated from the power supply, use an insulated tool such as an insulated screwdriver to protect against electric shock.

### External braking resistor (DVOP003)

5.6  $\Omega$  10W



#### <Precautions>

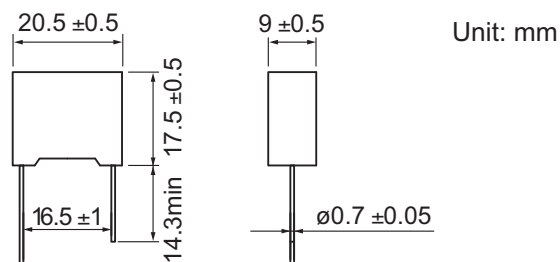
The resistance of DVOP003 is 5.6  $\Omega$ . When using commercially available resistor, choose 4.7-6.8  $\Omega$ , 10 W or larger.



## 5. Options

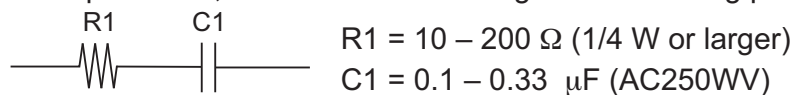
## Spark killer (DVOP008)

0.1  $\mu$  F 120 $\Omega$



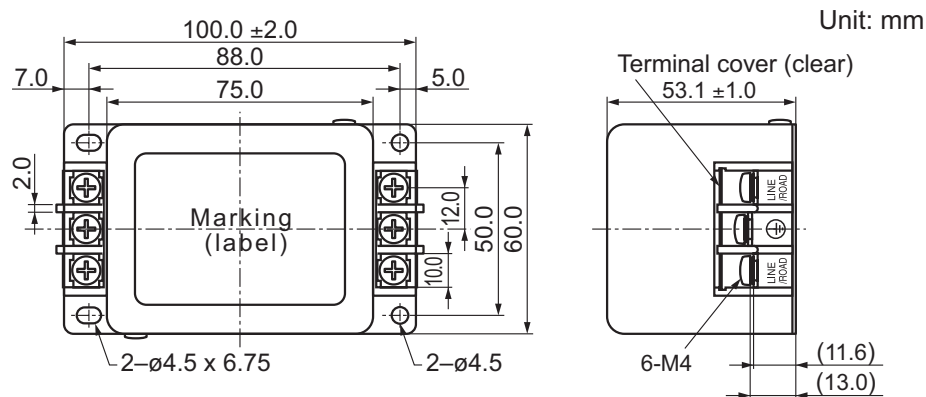
## <Precautions>

The capacitance of capacitor in the DVOP008 is 0.1 F and the resistance of the internal resistor is 120  $\Omega$ . When using commercially available spark killer, choose one consisting of the following parts:

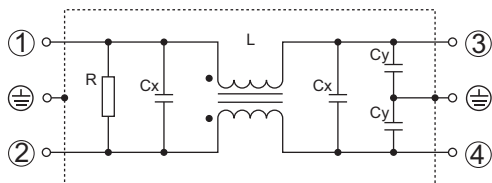


### Noise filter (DVOP3611-5)

Type SUP-EQ5-ER-6: Okaya Electric Industries Co., Ltd.

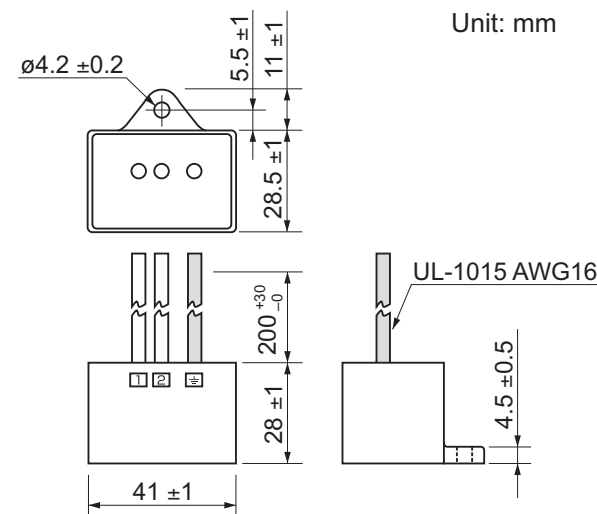


<Circuit diagram>

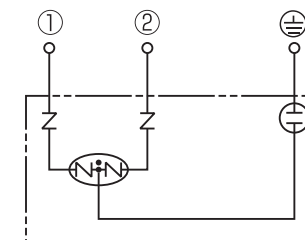


### Surge absorber (DVOP4190)

Type R.A.V-781BWZ-4: Okaya Electric Industries Co., Ltd.

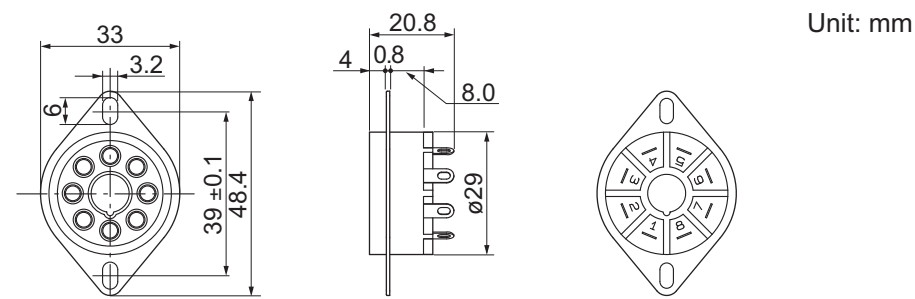


<Circuit diagram>



### Octal pin socket (DVOP4560)

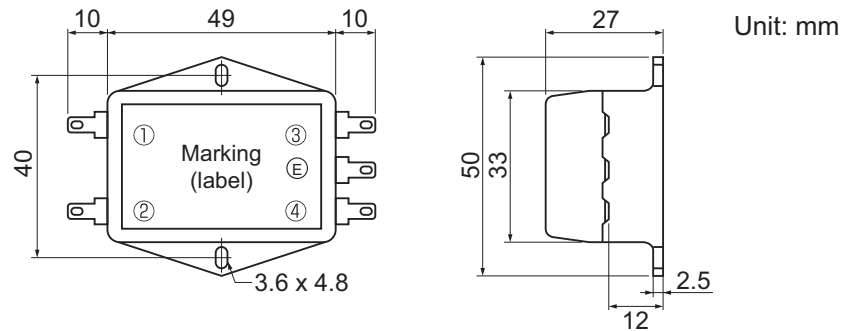
Type S-3898: Sato Parts Co., Ltd.



## 6. References

### Noise filter

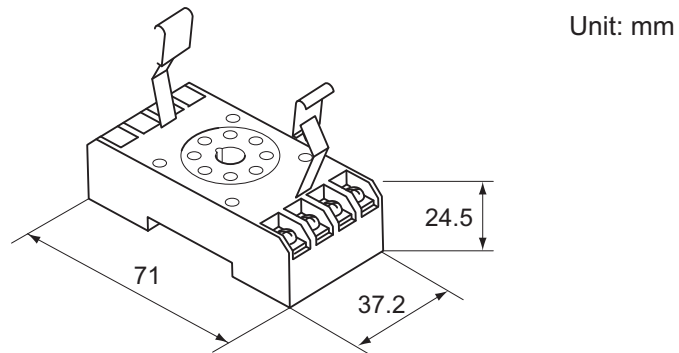
Type MR-2043: NEC Tokin Corporation



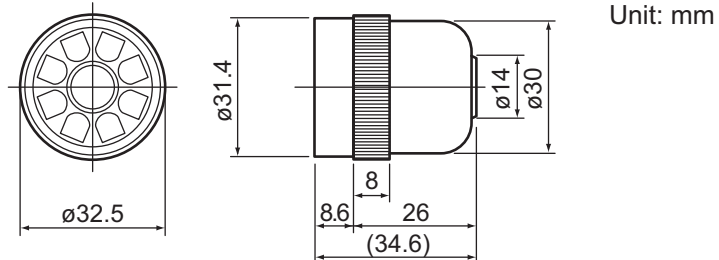
### Option common to compact timers from Panasonic Electric Works Co.,Ltd.

The following common timer option is available through your local agent for Panasonic Electric Works Co.,Ltd.

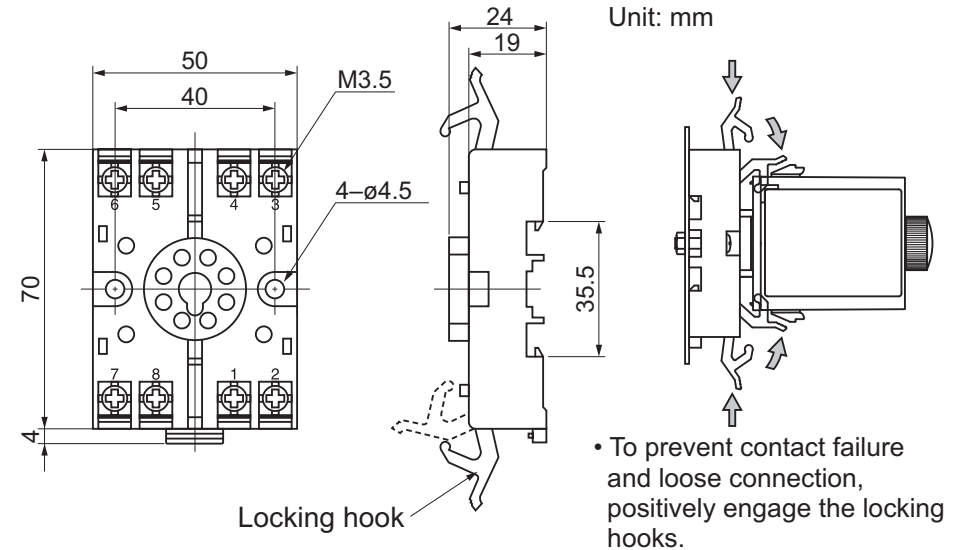
### Miniature DIN terminal block (AT7803)



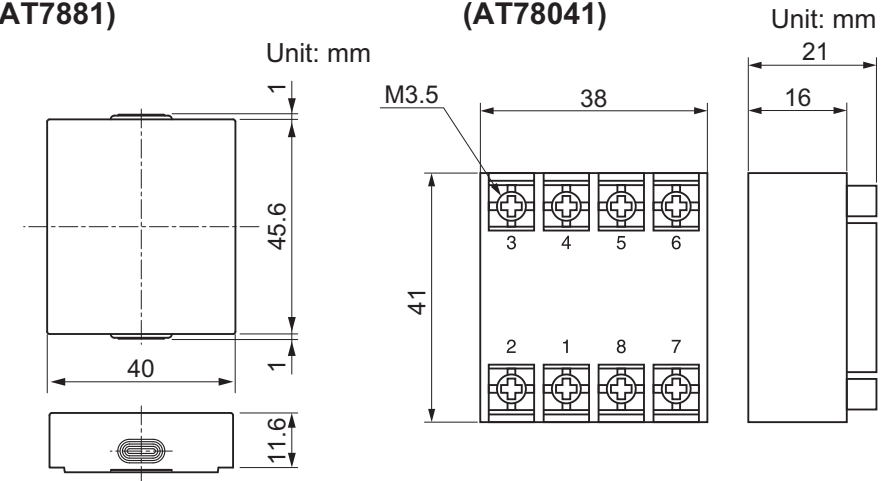
### 8P cap (AD8013)



### DIN rail terminal block (8-pin) (ATC180031)



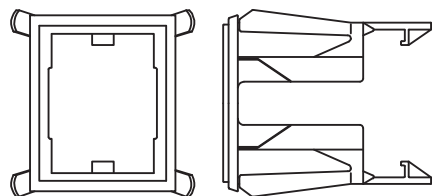
### Compact timer protection cover (AT7881) Rear panel terminal block (AT78041)



1. Prevents accidental operation after speed setting and also serves as a dustproof cover.
2. Use the cover together with the flush mounting frame described later.

## 6. References

### Flush mounting frame (Panasonic Electric Works Co.,Ltd.)



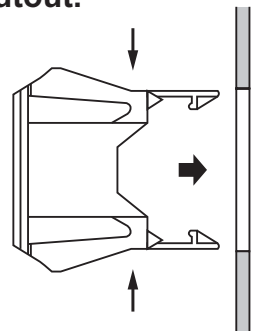
	Part No. ordered	Color	Control board mounting surface, front view	Mounting hole dimensions (unit: mm)
H type	AT7851	Gray		<p>* Distance between parallel holes 6.5 mm or more</p>
	AT7852	Black		
	AT7853	Silver gray		
K type	AT7811	Gray		<p>* Distance between parallel holes 11 mm or more</p>
	AT7812	Black		
	AT7813	Silver gray		
MHP type	AT7821	Gray		<p>* Distance between parallel holes 13 mm or more</p>
	AT7822	Black		
	AT7823	Silver gray		
MHP-M type	AT7831	Gray		<p>* Distance between parallel holes 21 mm or more</p>
S type	AT7841	Gray		<p>* Distance between parallel holes 8 mm or more</p>

\* Compatible panel thickness  
1.0—3.5 mm

# 6. References

## Installing

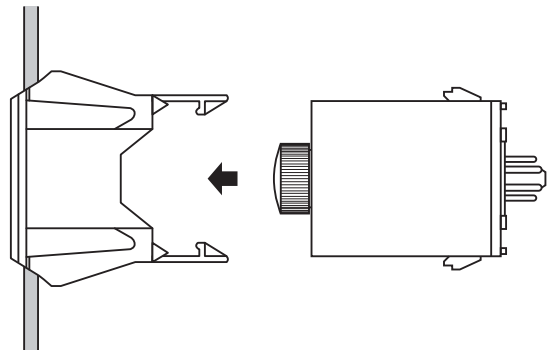
(1) Insert the mounting frame from the front panel of the cutout.



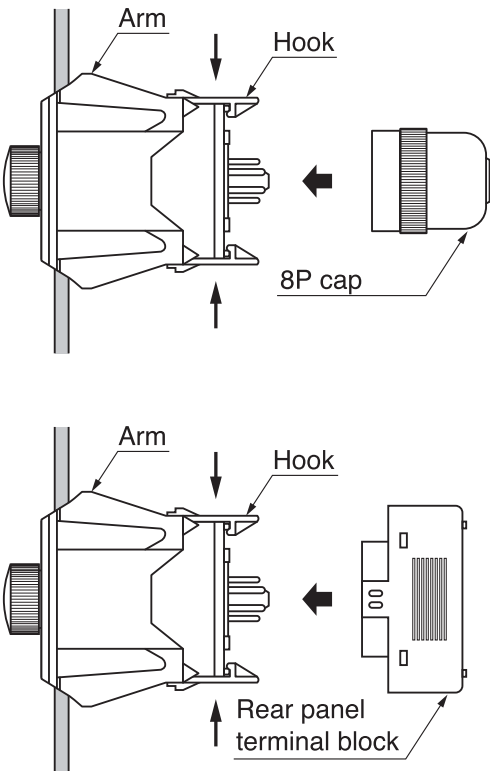
**[Note]**

Insertion of the mounting frame with the body into the panel is impossible.  
The S-type flush mounting frame can be inserted together with the body.

(2) After mounting the frame on the panel, insert the body from the rear.



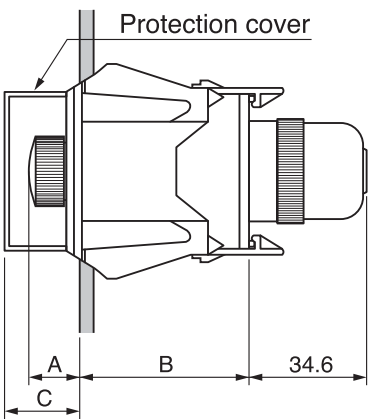
(3) Engage the hook with the base to fix it to the mounting frame.



**[Note]**

As the body touches the mounting frame rib, push upper and lower hooks in the direction of arrow for locking.  
For connecting wirings, use 8P cap (AD8013) and rear panel terminal block (AT78041).

## Mounted state



Mounting frame	Dimension A	Dimension B	Dimension C
H type K type	14.2	52.8	16.2
MHP type MHP-M type S type	15.7	51.3	17.7

## 7. Compatible with international standards

### EC directives

EC directives cover all general consumer electronics having specific functions and to be directly delivered to European Union (EU).

These electronic products must meet safety standards commonly applicable to all EU member nations, and must bear CE marking.

Our speed controllers are compatible with standards referenced by Low Voltage Directive so that the machines and devices incorporating these controllers will meet requirements of EC directives.

### Conformance to EMC directives

Our speed controllers have been verified to conform to standards associated with EMC directives by testing them using application models (conditions) representing typical installations and wiring with which these controllers will be used. Of course, it is impossible to simulate all actual operating conditions (e.g. wiring and grounding). Therefore, any equipment incorporating our speed controller should be checked on the items required by EMC directives (especially, unwanted radiation, noise, terminal voltage, etc.).

Pursuant to at the directive 2004/108/EC, article 9(2)

Panasonic Testing Centre  
Panasonic Service Europe,  
a division of Panasonic Marketing Europe GmbH  
Winsbergring 15, 22525 Hamburg, F.R. Germany

### UL/CE Certification

	Standard	Installation condition	File No.
UL	UL508 Standard for industrial control devices such as motor control		E228869
	EN50178 Electronic/electrical devices used in electric power facilities (Low Voltage Directive)		
CE	EN55011 Radio interference wave characteristics of high-frequency devices for industrial, scientific and medical application		
	EN61000-6-2 Immunity standard for industrial environment (EMC directive)		
	IEC61000-4-2 Electrostatic discharge immunity test	Overvoltage Category II	
	IEC61000-4-3 Radio frequency radiation field immunity test	Class II device	—
	IEC61000-4-4 Electrical high speed transient burst immunity test	Pollution degree 2	
	IEC61000-4-5 Lightning surge immunity test		
	IEC61000-4-6 High-frequency conductivity immunity test		
	IEC61000-4-11 Instantaneous power interruption immunity test		

## 7. Compatible with international standards

### Peripherals layout practices

<b>Power source</b>	<ul style="list-style-type: none"> <li>100 V system: 1-p 100-120 V <math>\pm 10\%</math>, 50/60 Hz</li> <li>200 V system: 1-p 200-240 V <math>\pm 10\%</math>, 50/60 Hz</li> <li>Use it in environment of overvoltage category II specified in IEC 60664-1.</li> <li>When using in overvoltage category III environment, connect an insulating transformer conforming to EN standard or IEC standard to the input of the speed controller.</li> <li>Electric wire size should be compatible with EN 60204-1.</li> </ul>
<b>Circuit breaker or fuse</b>	Connect a specified UL and IEC standard approved circuit breaker or UL approved fuse between the power source and the noise filter. This configuration meets requirements of UL508 (file No.E228869).
<b>Noise filter</b>	When using two or more speed controllers together with one noise filter, consult the noise filter manufacturer.
<b>Surge absorber</b>	Connect a surge absorber to the primary side of the noise filter. Disconnect the surge absorber before conducting withstand voltage test of machine/device to protect the surge absorber.
<b>Ground</b>	Connect the protective earth (PE) to the motor and noise filter connected to the speed controller.

### Speed controller and peripherals

Product	Option part No.	Manufacturer part No.	Manufacturer
Noise filter	—	MR-2043	NEC Tokin Corp.
Surge absorber	DV0P4190	R.A.V-781BWZ-4	Okaya Electric Industries Co., Ltd.

### Recommended circuit breakers

Sanken Airpax Co., Ltd.

Type single-phase: IELH-1-11-63-5A-M

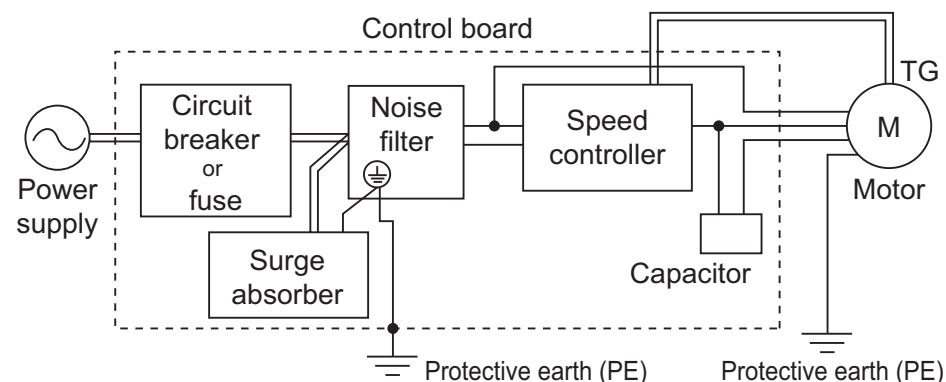
Rated current 5 A, current breaking characteristic DELAY63

Recommended current breaking characteristic: DELAY61-63

### Installation environment

Use the speed controller in pollution degree 2 or 1 as specified in IEC60664-1.

(Example: Installed the controller in IP54 control board)



\* The length of connection cable between the speed controller and motor should be shorter than 3 m.

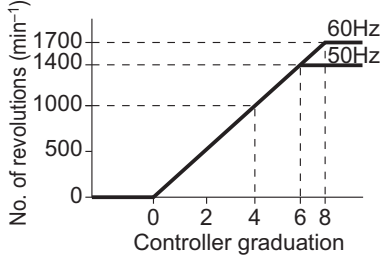
### Manufacturer of peripherals

As of September 2006

Manufacturer	TEL
Okaya Electric Industries Co., Ltd.	East Japan : 03-3424-8120
	West Japan : 06-6392-1781
NEC Tokin Corporation	East Japan : 03-3515-9151
	West Japan : 06-6263-6781
Panasonic Electric Works Co., Ltd.	06-6908-1131
Sanken Airpax Co., Ltd.	East Japan : 0492-83-7575
	West Japan : 06-6312-8716
Sato Parts Co., Ltd.	06-6643-2561

## 8. Specification

### General specification

Part No.	MGSDA1	MGSDB1	MGSDB2
Power source	ø1 100 – 120 VAC		ø1 200 – 240 VAC
Supply voltage permissible variable range	Rated voltage $\pm 10\%$		
Power supply frequency	50/60Hz		
Rated input current	1.0A	2.0A	1.0A
Compatible motor output	3 – 40W	60 – 90W	6 – 90W
Speed control range	50Hz : 90 – 1400min <sup>-1</sup> 60Hz : 90 – 1700min <sup>-1</sup> Speed will vary depending on variation in motor performance and operating conditions (temperature, noise). 		
Speed variations (against load)	5% (standard) 1000min <sup>-1</sup> , Amount of change in speed at 80% rated torque		
Speed setting	Internal		
Braking *1	Active while electric braking current is flowing		
Electric braking time	0.5 s (standard) Amount of braking current is 2-3 times the rated current.		
Parallel running	Not applicable		
Equipment weight	80g		

\*1 Electric braking has no mechanical brake holding mechanism.

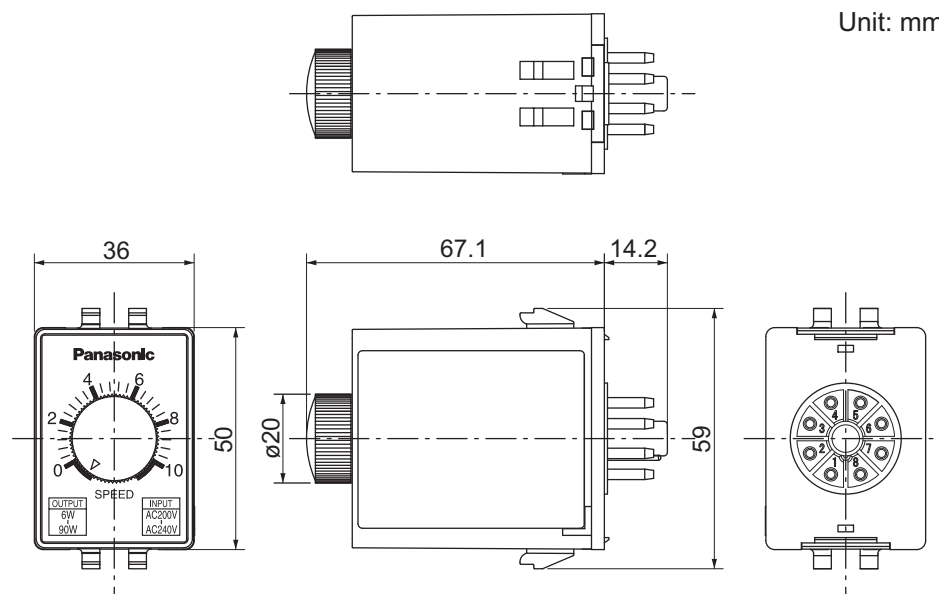
Reversible motor has simple continuous sliding brake which will provide certain mechanical holding function.

To provide further brake holding, use our C&B motor (unidirectional only) or variable speed motor containing electromagnetic brake.

When braking a load having excessively high inertia, durability and life expectancy of motor shaft and gear should be taken into consideration. Use the motor within the allowable inertia.

### Dimensions

#### • Speed controller





## 9. Inspection and maintenance

### Inspection

Periodically check and maintenance to assure safe and reliable operation of the speed controller.

#### Practical considerations for checking and maintenance

Turning off/on of power supply must be done by the personnel responsible for the maintenance work.

#### Checking items and period of maintenance work

Under normal operating condition

**Ambient temperature (annual average) 30°C,  
100% load factor, 20 hours max./day**

Perform daily check and periodic check as shown below:

Category	Frequency	Check for
Daily check	Every day	<ul style="list-style-type: none"> <li>• Ambient temperature, humidity, dust, dirt, foreign material</li> <li>• Unusual vibration, shock, sound</li> <li>• Smell</li> <li>• Damaged wiring</li> <li>• Misalignment</li> <li>• Contaminated pin</li> <li>• Loose connection (motor, devices)</li> <li>• Foreign matters on load</li> </ul>
Periodic check	Once/year	• Excessively overheating motor

#### <Precautions>

The frequency specified for periodic check should be changed as necessary depending on operating condition.

#### Guideline for replacement

No reference can be established since components and parts should be replaced based on operating condition and method. Replace or repair defective or malfunctioning parts.



DON'T

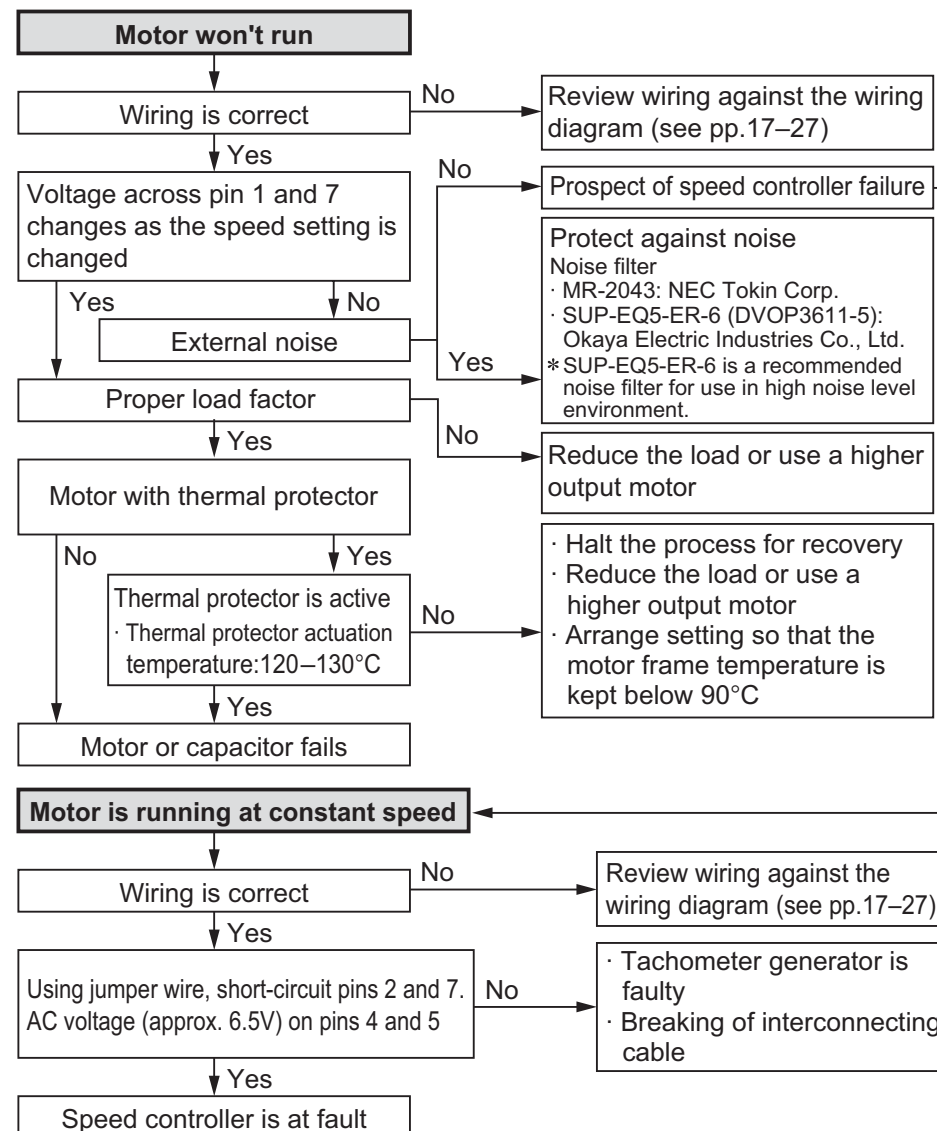
**Consult us when it is necessary to overhaul the assembly.**

Product	Category	Life expectancy	Remarks
Speed controller	Electrolytic capacitor	Approx. 5 years	Life expectancy is reference for replacement. Potentially defective part must be replaced before expected lifetime.
Motor, gear	See motor instruction manual.		

### Troubleshooting

If a problem occurs with your system, use the following procedure for locating and remove the cause.

In the event the problem cannot be isolated or the speed controller is suspected, or if you have any questions, please contact us or your local agency.



## After-Sale Service (Repair)

## Repair

Consult to a dealer from whom you have purchased the product for details of repair.

When the product is incorporated to the machine or equipment you have purchased, consult to the manufacuter or the dealer of the machine or equipment.

### Cautions for Proper Use

- This product is intended to be used with a general industrial product, but not designed or manufactured to be used in a machine or system that may cause personal death when it is failed.
- Install a safety equipments or apparatus in your application, when a serious accident or loss of property is expected due to the failure of this product.
- Consult us if the application of this product is under such special conditions and environments as nuclear energy control, aerospace, transportation, medical equipment, various safety equipments or equipments which require a lesser air contamination.
- We have been making the best effort to ensure the highest quality of the products, however, application of exceptionally larger external noise disturbance and static electricity, or failure in input power, wiring and components may result in unexpected action. It is highly recommended that you make a fail-safe design and secure the safety in the operative range.
- If the motor shaft is not electrically grounded, it may cause an electrolytic corrosion to the bearing, depending on the condition of the machine and its mounting environment, and may result in the bearing noise. Checking and verification by customer is required.
- Failure of this product depending on its content, may generate smoke of about one cigarette. Take this into consideration when the application of the machine is clean room related.
- Please be careful when using in an environment with high concentrations of sulphur or sulphuric gases, as sulphuration can lead to disconnection from the chip resistor or a poor contact connection.
- Take care to avoid inputting a supply voltage which significantly exceeds the rated range to the power supply of this product. Failure to heed this caution may result in damage to the internal parts, causing smoking and/or a fire and other trouble.

# MEMO

### Technical information

Technical information of this product (Instruction Manual, CAD data) can be downloaded from the following web site.

[http://industrial.panasonic.com/ww/i\\_e/25000/motor\\_fa\\_e/motor\\_fa\\_e.html](http://industrial.panasonic.com/ww/i_e/25000/motor_fa_e/motor_fa_e.html)

MEMO (Fill in the blanks for reference in case of inquiry or repair.)

<b>Date of purchase</b>		<b>Model No.</b>	<b>MGSD</b> _____
<b>Dealer</b>			
	Tel: (     )                      -		

**Motor Business Unit, Panasonic Corporation**

7-1-1 Morofuku, Daito, Osaka, 574-0044, Japan Phone : +81-72-871-1212